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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/583,519

06/16/2006

Kohei Kawamura

10873.2267USWO

1418

52835

7590

06/01/2009

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EXAMINER

KRYLOVA, IRINA

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

06/01/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/583,519	<b>Applicant(s)</b> KAWAMURA ET AL.	
	<b>Examiner</b> Irina Krylova	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Terminal Disclaimer***

1. The terminal disclaimer filed on 02/27/2009 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of any patent granted on Application number 11/667,633, has been reviewed and is accepted. The terminal disclaimer has been recorded.

2. All rejections are withdrawn in light of Applicant's amendment filed on 02/27/2009. The new grounds of rejection set forth below are necessitated by Applicant's amendment filed on 02/27/2009. In particular, claim1 has been amended to include limitations of the copolymerizable monomer used in the copolymers (A) and (B) being at least one selected from the group consisting of acrylic acid, methacrylic acid and lower alkyl esters thereof, and methyl acrylate. Thus, these limitations were not previously presented and were taken from the specification (see page 5, lines 6-27 of the instant specification). Therefore, the following action is properly made final.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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**3. Claims 1-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Fester et al** (US 4,383,086) in view of **Streetman et al** (US 4,524,105), as evidenced by **Szita et al** (US 3,493,547).

**4. **Fester et al**** discloses a high shrinkable fiber comprising a mixture of:

1) 20-70% of a copolymer A and

2) 30-80 % of a copolymer B, wherein:

copolymer A comprises:

- at least 80% by weight of acrylonitrile;
- 0.3-20 % by weight of other units copolymerizable with acrylonitrile,  
comprising acrylic esters, vinyl chloride and sulfonic acid containing monomers;

copolymer B comprises:

- 50-75 % by weight of acrylonitrile;
- 25-45 % by weight of vinyl chloride or vinylidene chloride;
- 0-5 % weight of other units copolymerizable with acrylonitrile comprising sulfonic acid-containing monomers, acrylic acid, methacrylic acid, and esters thereof (Abstract; col. 2, lines 48-60; col. 3, lines 16-34).

5. The specific example provided the following composition:

**copolymer A:**

- 94.3%wt acrylonitrile;
- 6%wt acrylic ester;

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- 0.7 %wt Na methallyl sulfonate;

**copolymer B:**

– 80 % acrylonitrile;

- 15% vinylidene chloride;

– 2% Na methallyl sulfonate;

- 3% methyl acrylate (see Table 1).

As to instant claim 2, the total content of the sulfonic acid group containing monomers in the mixture of copolymer A and B falls within the range 0.1-10%.

Copolymer A and copolymer B were mixed in the ratio 50:50, drawn through spinneret and heated at 135°C to give boil-off shrinkage of 39% (Table 1; Table 2).

**6. Fester et al** fails to teach the copolymer B having the content of methyl acrylate units in the range of 10-99%.

**7. Streetman et al** discloses an acrylonitrile fiber having improved **dye intensity** comprising a blend of compatible polymers of acrylonitrile with hydrophilic moieties, wherein the hydrophilic moieties comprise acrylic acid, methacrylic acid, methallyl sulfonic acid, acrylamidomethylprop[ane sulfonic acid (col. 4, lines 22-45; col. 5, lines 34-45). The specific acrylonitrile copolymer provided in Example 3 comprises:

1) acrylonitrile 87.5%wt;

2) methyl methacrylate 11.5%;

3) acrylamidomethylpropane sulfonic acid 1.0%wt (col. 9, lines 1-11).

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8. Since

1) **Fester et al** discloses a **high shrinkable fiber** comprising a blend of two copolymers (A) and (B) comprising acrylonitrile, acrylic ester and sulfonic acid units, each copolymer having specific amounts of the comonomers, but fails to teach the copolymer (B) having methyl acrylate units in the range of 10-99%;

2) **Streetman et al** discloses an acrylonitrile fiber having improved **dye intensity** comprising a blend of copolymers of acrylonitrile with methyl methacrylate and sulfonic acid monomers, wherein one of the copolymers comprises 11.5%wt of methyl methacrylate units;

3) it is known in the art that incorporation of a methyl acrylate comonomer into an acrylonitrile-sulfonic acid copolymer improves dying properties of the fiber (see col. 4, lines 5-10 in **Szita et al** US 3,493,547), therefore,

it would have been obvious to a one skilled in the art at the time of the invention was made to include acrylonitrile-methylmethacrylate-sulfonic acid copolymer of **Streetman et al** into the **high shrinkable fiber** composition of **Fester et al** to further improve dyeability of the high shrinkable fiber of **Fester et al** (see col. 4, lines 5-10 in **Szita et al** US 3,493,547).

9. As to instant claims 3-6, though neither **Fester et al** nor **Streetman et al** provide a shrinkage percentage of the above acrylic fiber when treated with dry heat at 130°C for five minutes after dyeing it at a temperature of less than 80°C and a relative saturation value when dyed at less than 80°C, nevertheless, since the acrylic fiber of **Fester et al**

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in view of **Streetman et al** comprises the same composition as claimed in the instant invention, therefore, these properties would have been expected by one of ordinary skill in the art to be inherently present in the composition of **Fester et al** in view of **Streetman et al**. "Products of identical chemical composition can not have mutually exclusive properties" (See MPEP 2112.01).

**10. Claims 1-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Fester et al** (US 4,383,086) in view of **Tamura et al** (US 4,447,384), as evidenced by **Szita et al** (US 3,493,547).

11. The discussion with respect to **Fester et al** (US 4,383,086) as set forth in paragraphs 3-5 above is incorporated here by reference.

**12. Fester et al** fails to teach the copolymer B having the content of methyl acrylate units in the range of 10-99%.

**13. Tamura et al** discloses an acrylic fiber comprising a copolymer of the following monomers:

- A) at least 85%wt acrylonitrile;
- B) 10%wt of an acrylic acid, methacrylic acid or esters thereof;
- C) 3%wt of allylsulfonic acid or methallylsulfonic acid (col. 3, lines 1-15).

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14. The fiber has a shrinkage of 10-40% after drying and relaxation at 130°C (col. 3, lines 65-68).

**15. Tamura et al** also teaches that an allylsulfonic acid, methallylsulfonic acid, an acrylic acid, methacrylic acid or esters thereof improve dyeability of the fiber (col. 3, lines 9-10).

16. Since:

1) **Fester et al** discloses a **high shrinkable fiber** comprising a blend of two copolymers (A) and (B) comprising acrylonitrile, acrylic ester and sulfonic acid units, each copolymer having specific amounts of the comonomers, but fails to teach the copolymer (B) having methyl acrylate units in the range of 10-99%;

2) **Tamura et al** discloses an acrylic fiber comprising a copolymer of an acrylonitrile, allylsulfonic acid and 10%wt of an acrylic acid, methacrylic acid or esters thereof, wherein the copolymer comprises high shrinkage and dyeability properties (col. 3, lines 9-10, col. 4, lines 1-2);

3) it is known in the art that incorporation of a methyl acrylate comonomer into an acrylonitrile-sulfonic acid copolymer improves dyeing properties of the fiber (see col. 4, lines 5-10 in **Szita et al** US 3,493,547), therefore,

it would have been obvious to a one skilled in the art at the time of the invention was made to include acrylonitrile-methyl acrylate-sulfonic acid copolymer of **Tamura et al** into the fiber composition of **Fester et al** to further improve dyeability and shrinkage properties of the fiber composition of **Fester et al**.



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17. As to instant claims 3-6, since the acrylic fiber of **Fester et al** in view of **Tamura et al** comprises the same composition as claimed in the instant invention, therefore, these properties would have been expected by one of ordinary skill in the art to be inherently present in the composition of **Fester et al** in view of **Tamura et al**. "Products of identical chemical composition can not have mutually exclusive properties" (See MPEP 2112.01).

### ***Response to Arguments***

18. The terminal disclaimer filed on 02/27/2009 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of any patent granted on Application number 11/667,633, has been reviewed and is accepted. The terminal disclaimer has been recorded.

19. Applicant's arguments filed on 02/27/2009 have been fully considered but they are not persuasive.

20. Applicant argues that Fester et al does not teach the content of a copolymerizable monomer in copolymer (B) being at 10-99%wt, whereas Cazzaro et al fails to teach the presence of the third copolymerizable monomer. Examiner disagrees. The rejection over **Cazzaro et al** was withdrawn in light of the Applicant's amendments filed on 02/27/2009. All limitations claimed in the amended application are now met by a combination of references of **Fester et al** in view of **Tamura et al** and **Fester et al** in

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view of **Streetman et al**, and are rejected under 35 U.S.C. 103. Specifically, see the discussion in paragraphs 3-17 above.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irina Krylova whose telephone number is (571)270-7349. The examiner can normally be reached on Monday-Friday 7:30am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasudevan Jagannathan can be reached on (571)272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/I. K./  
Examiner, Art Unit 1796

/Vasu Jagannathan/  
Supervisory Patent Examiner, Art Unit 1796